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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/006,444 | 11/20/2001 | James A. Aman | | 4158 |

7590 02/28/2005
James A. Aman
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Lansdale, PA 19446

EXAMINER

SENF, BEHROOZ M

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2613

DATE MAILED: 02/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/006,444

Applicant(s)

AMAN ET AL.

Examiner

Behrooz Senfi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date AprandMar,2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Jain et al (US 5,745,126).

Regarding claim 1, Jain '126 discloses, "an automated system for tracking the movement of multiple objects within a predefined area" (i.e. figs. 2 and 6) comprising: "a fixed area tracking matrix for first detecting the motion of each object in (X, Y) space and first algorithm operated on a computer system responsive to the fixed area tracking matrix for determining the (X, Y) location of each object" (i.e. fig. 6, col. 8, lines 50 – 65, col. 17, lines 51 – 61, col. 18, lines 63 – 65 and col. 24, lines 1 – 20) and "a movable volume tracking matrix (player volume, fig. 6) responsive to the determined (X, Y) locations for controllably detecting the motion of each object in (X, Y, Z) space; and a second algorithm operated on the computer system responsive to the movable volume tracking matrix for determining the (X, Y, Z) dimensional characteristics of each object" (i.e. col. 5, lines 46 – 55, col. 7, lines 51 – col. 8, lines 15, col. 16, lines 40 – 61 and col. 17, lines 1 – 7 and lines 38 – 55) and "forming a database representative of

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each object's locations, movements and dimensional characteristics" (i.e. fig. 1, abstract, col. 20, lines 28 – 34).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 - 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain '126 as applied to claim 1 above in view of Leis (US 6,061,644).

Regarding claims 2 and 7, Jain '126 teaches, "an automated system for tracking the movement of multiple objects within a predefined area using multiple CCD cameras and tags and tracks objects in the scene" as discussed in, claim 1. It is noted that Jain '126 does not particularly teach "one or more energy sources emitting non-visible energy that is detected by both the area and volume tracking matrices and markers adhered onto multiple location on each object (player) that reflect the non-visible energy". However such features are well known and used in the prior art of the record as evidenced by Leis '644 (i.e. fig. 1, 24L and 24R "infrared energy" and markers, col. 4, lines 22 – 24 and col. 2, lines 61 - 67). Therefore, it would have been obvious to one skilled in the art at the time of the invention was made to modify the tracking system of Jain '126 by placing markers on each objects that reflects non-visible energy/light as taught by Leis '644 for more sufficient accuracy of tracking multiple objects. Doing so would improve the accuracy of object position and orientation determination. And as for

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the “third algorithm operated on the computer system responsive to the non-visible energy” reads on (i.e. fig. 1, element 28, col. 4, lines 17 – 52, col. 6, lines 4 – 20 of Leis).

Regarding claims 3 – 4 and 9 - 10, the limitations as claimed are substantially similar to claim 2, therefore the grounds for rejecting claim 2 also applies here. Furthermore, as for the object identity and changing location “from the outer area to include additional changing location information based upon each object’s movements in the predefined area in claims 3 and 4”, since the MPI system of Jain ‘126 identifies players, it can also recognize when they enter or leave the field of play, also (col. 12, lines 31 – 35 and cols. 29 – 30, lines 59 – 6 of Jain).

Regarding claim 6, the limitations as claimed are substantially similar to claim 2, therefore the grounds for rejecting claim 2 also applies here. Furthermore, as for the claim “spherical markers”. The combination teaching of Jain and Leis does not particularly show the physical shape of the markers as being “spherical markers”. However, The shape of a marker does not carry any critical weight and it does not consider patentably significant and is more like design preferences.

Regarding claims 8, 12 and 16, combination of Jain ‘126 and Leis ‘644 teach, “a fixed area tracking matrix for first detecting the motion of each object in (X, Y) space and “a computer system responsive to the fixed area tracking matrix for determining the (X, Y) location of each object” (i.e. fig. 6, col. 8, lines 50 – 65, col. 17, lines 51 – 61, col. 18, lines 63 – 65 and col. 24, lines 1 – 20) and “a movable volume tracking matrix (player volume, fig. 6) responsive to the determined (X, Y) locations for controllably

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detecting the motion of each object in (X, Y, Z) space; and "the computer system responsive to the movable volume tracking matrix for forming a database of related coordinates of each marker on each object" (i.e. fig. 1, abstract, col. 20, lines 28 – 34).

Regarding claims 9, 11 and 18, the limitations as claimed are substantially similar to claims 3 and 7, therefore the grounds for rejecting claims 3 and 7 also applies here.

Regarding claims 14 - 15, the limitations as claimed are substantially similar to claim 4, therefore the grounds for rejecting claim 4 also applies here. Further, as for the claim limitations "outer area cameras and predefined cameras". Combination of Jain '126 and Leis '644 teach plurality of camera setup to identify players/objects, it can also recognize when they enter or leave the field of play, further (fig. 17a – 17d, col. 34, lines 36 – 48 of Jain). In view of the above, it would have been obvious to have a camera setup, which track/identify the objects in either fields.

Regarding claims 20 – 21, 23 – 24, 26 – 27, 29 – 30 and 32 – 33, combination of Jain '126 and Leis '644 teach, "overlapping field of view" (i.e. col. 33, lines 40 – 46 of Jain).

Regarding claims 13, 17, the limitations claimed are substantially similar to claim 2, therefore the grounds for rejecting claim 2 also applies here.

Regarding claims 22 and 28, the limitations claimed are substantially similar to claims 7 and 11, therefore the grounds for rejecting claims 7 and 11 also applies here.

Regarding claim 19, the limitations as claimed are substantially similar to claim 7, therefore the grounds for rejecting claim 7 also applies here. It is noted that the combination teaching of Jain '126 and Leis '644 does not particularly mention "visible

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energy". However Leis '644 (i.e. col. 1, lines 10 – 15 and col. 2, lines 5 – 10) teaches retro-reflectors as point markers. It is well known to one skilled in the art, that the retro-reflector markers/material are also capable of reflecting/emitting visible light, which reflects light directly back to the source of the light, see also (US 5,227,985 reference cited by Leis).

Regarding claim 5, the limitations claimed are substantially similar to claims 2 and 19 (for visible light), therefore the grounds for rejecting claims 2 and 19 also applies here.

Regarding claims 25 and 28, the limitations as claimed are substantially similar to claims 11 and 19, therefore the grounds for rejecting claims 11 and 19 also applies here.

Regarding claims 10, 15 and 31, the limitations claimed are substantially similar to claims 15 and 19, therefore the grounds for rejecting claims 15 and 19 also applies here.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone number is **(703)305-0132**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Chris Kelley** can be reached on **(703)305-4856**.

Any response to this action should be mailed to:

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Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:


(703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

B. S. B. S.

2/15/2005


CHRIS KELLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600